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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/783,460

02/20/2004

Cristian E. Anghel

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7456

7590

05/13/2005

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EXAMINER

LEYKIN, RITA

ART UNIT

PAPER NUMBER

2837

DATE MAILED: 05/13/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/783,460

Applicant(s)

ANGHEL ET AL.

Examiner

Rita Leykin

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-22 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-4, 6-15 and 17-22 is/are rejected.
- 7) ☒ Claim(s) 5 and 16 is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All    b) ☐ Some \*    c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 5/3/04.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_.

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

1. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 1 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Jansen et al. US# 5,585,709.

3. With respect to claims 1, 2, 6, and 12, 13, 17 Jansen et al. teach a drive system for polyphase AC machine that provides power to the stator windings of the machine which includes a component at the fundamental drive frequency. Wherein the synchronous inductance in synchronous machines changes as a periodic function of rotor rotational position. And wherein the stator response at the signal frequency may be detected and measured to provide a correlation between the magnitude of response at the signal frequency and the rotor position. The information on rotor position as a function of time can be utilized in a controller to provide appropriate fundamental frequency drive power to the motor to drive the motor at a desired speed or torque, or to a desired position.

In Jansen et al. Fig. 1, the position and velocity observer 43 receives excitation signal frequency current and voltage signals on lines 44 and 45 from a filter and coordinate transform circuit 46 which is connected to lines 34-36 to measure a voltage and current on these lines. The circuit 46 by coordinate transformation converts the

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measured three phase motor currents into the equivalent d-axis and q-axis. Based on measured voltage the system also provides two equivalent d-axis and q-axis voltages. The position and velocity observer 43 uses information on lines 44 and 45 to provide estimates for the rotor position and speed, which is provided as, outputs on lines 47, 48. The filters and coordinate transform 46 reads on applicant's filtering phase voltage signals output from main stator windings of the synchronous machine, and in combination with position and velocity observer outputs 47 and 48 also reads on claimed two-phase quadrature signals indicating positioning of the rotor. The system utilizes field oriented controller 71 that is provided with velocity input from observer 43 via state space motion controller, wherein the output of 71 is connected to current regulated inverter with high frequency signal injection 38. That reads on applicant's control of excitation frequency as a function of rotor speed.

With respect to claims 4 and 15, Fig. 4a and 4b show the utilization of BPF (band pass filter) and wherein the fixed pass bands in form of LPF and HPF (low pass filter and high pass filter) are used.

With respect to claims 7 and 18, please see cited in Jansen et al. publication "Analog Devices 1989/90 Data Conversion Products Databook, Synchro & Resolver Converters, AD2S90 Resolver-To-Digital Converter.

With respect to claims 8 and 19 the use of Clarke transformation to convert three phase quantities into two-phase quadrature quantities is well known.

With respect to claims 9 and 20, in the system of FIG. 4A, signals representing the quadrature output voltages  $V^s_{qds}$  are also provided from the transform circuit 83 on

lines 86 to a band-pass filter 87. The filtered signals  $V^s_{qdsi}$  are subtracted at a summing junction 89 from a commanded signal  $V^{s*}_{qdsi}$  (e.g., a desired constant amplitude balanced polyphase signal).

With respect to claims 10, 11 and 21, 22 it appears in Jansen et al. teaching in column 1, lines 62 that due to structure of rotor the rotor impedance is changed and affects the response of the stator windings to the excitation signal at the signal frequency as a function of rotor rotational position, since a field saturation depends of the field impedance.

Hence, it has been obvious to one of ordinary skills in the art, at the time invention was made to use Jansen et al. teaching to control motor speed and/or rotor position via controlling excitation frequency without of use of rotor position detecting device.

The reason is to estimate position and/or velocity of the ac machine.

***Allowable Subject Matter***

4. Claims 5 and 16, objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

5. The following is a statement of reasons for the indication of allowable subject matter. The prior art made of record in the attached form PTO-892 considered to be pertinent to the submitted application.

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6. However, none of the prior art teaches or suggest in combination:

- The definition of fixed pass band according to claimed equation.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Rita Leykin whose telephone number is (571)272-2066.

The examiner can normally be reached on Monday-Friday 8:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Martin can be reached on (571)272-2107. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R.L.

Rita Leykin  
Primary Examiner  
Art Unit 2837

